

WHAT IS CLAIMED IS:

1. A method for centering a multi-band voltage controlled oscillator (VCO) comprising:
  - 5 establishing a tuning signal window;
  - determining if the tuning signal for the multi-band VCO is outside the tuning signal window; and
  - changing a band select signal in response to the determining.
- 10 2. The method of claim 1 wherein the band select signal is changed only when the tuning signal is determined to be outside the tuning signal window.
3. The method of claim 2 wherein changing the band select signal comprises changing the band select signal N times after lock is achieved.
- 15 4. The method of claim 3 wherein N equals 1.
5. The method of claim 3 wherein changing the band select signal includes incrementing or decrementing a count in response to the tuning signal determination  
20 and in response to whether or not the multi-band VCO is in lock.
6. The method of claim 1 wherein the band select signal is changed only when:  
the tuning signal is determined to be outside the tuning signal window; and  
one of, 1) the multi-band VCO is out of lock, and 2) the band select signal has  
25 changed less than N times after lock is achieved.
7. The method of claim 1 wherein changing the band select signal includes incrementing or decrementing a count.
- 30 8. The method of claim 7 further including preventing said count from rolling over.

9. The method of claim 1 further including repeating the determining and the changing continuously during operation of the multi-band VCO.

10. A system for centering a multi-band voltage controlled oscillator (VCO), the system comprising:

a counter configured to generate a band select signal for selecting a frequency band of the multi-band VCO; and

a window comparator in signal communication with said counter, the window comparator connected to receive a tuning signal from the multi-band VCO;

10 wherein the band select signal generated by said counter is changed in response to a comparison signal output by the window comparator.

11. The system of claim 10 wherein the band select signal generated by the counter is changed only when the comparison signal indicates that the tuning signal is outside the tuning signal window.

12. The system of claim 11 further including a controller configured to allow the band select signal to change N times after lock is achieved.

20 13. The system of claim 12 wherein N equals 1.

14. The system of claim 12 wherein the controller includes logic for receiving a signal indicating the lock status and for generating an update counter signal in response to the signal.

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15. The system of claim 11 additionally comprising logic for incrementing or decrementing the counter in response to the tuning signal determination and whether or not the multi-band VCO is in lock.

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16. The system of claim 11 additionally comprising logic for ensuring that the band select signal generated by the counter can be changed only when:

the tuning signal is determined by the window comparator to be outside the tuning signal window; and

5 one of, 1) the multi-band VCO is out of lock, and 2) the band select signal has changed less than N times after lock is achieved.

17. The system of claim 11 wherein said counter is a saturating counter.

10 18. The system of claim 11 wherein said window comparator includes two voltage comparators configured to compare the tuning signal with upper and lower voltage boundaries.

19. A system for centering a multi-band voltage controlled oscillator (VCO) comprising:

15 a counter configured to generate a band select signal for selecting a frequency band of a multi-band VCO;

a window comparator in signal communication with said counter configured to compare a tuning signal to a tuning signal window and to output a comparison signal  
20 that allows the band select signal to be changed only when the tuning signal is outside the tuning signal window; and

a controller in signal communication with said counter configured to allow the band select signal to be changed while the multi-band VCO is controlled by a lock detector and to be changed N times after control of the multi-band VCO is given up  
25 by the lock detector.

20. The system of claim 19 wherein said window comparator includes two voltage comparators configured to compare the tuning signal with upper and lower voltage boundaries.

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